

ZOOLOGY.—*Two new crayfishes of the genus Procambarus from South Carolina.*  
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 municated by Fenner A. Chace, Jr.)

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The two crayfishes described herein are members of the Pictus Group, the range of which appears to be restricted to the southeastern part of the United States. Included in this group are: *P. lepidodactylus* Hobbs (1947b: 25), *P. pubescens* (Faxon, 1884: 109), *P. enoplosternum* Hobbs (1947a: 5), *P. litosternum* Hobbs (1947a: 9), *P. pictus* (Hobbs, 1940a: 419), *P. youngi* Hobbs (1942: 131), *P. angustatus* (LeConte, 1856: 401), *P. lunzi* (Hobbs, 1940b: 1), *P. seminolae* Hobbs (1942: 142), *P. lucifugus lucifugus* (Hobbs, 1940a: 398), *P. lucifugusalachua* (Hobbs, 1940a: 402), *P. pallidus* (Hobbs, 1940a: 394), and the two species described below.

A discussion of the interrelationships among these crayfishes has been submitted for publication under the title, "The Evolutionary History of the Pictus Group of the Crayfish Genus *Procambarus*" (Hobbs, in press).

***Procambarus hirsutus*,<sup>1</sup> n. sp.**

*Procambarus* sp. B. Hobbs (in press).

*Diagnosis*.—Rostrum with marginal spines; upper surface pubescent and hirsute at base of acumen; acumen of moderate length and slender; areola 2.5 to 3.5 times longer than broad, with 8 to 10 punctations in narrowest part, and constituting from 25.5 to 30.0 percent of total length of carapace; postorbital ridges terminating cephalically in sharp spines; a single acute lateral spine on each side of carapace; inner margin of palm of chela of first form male with a poorly defined row of eight to ten small tubercles; male with hooks on ischiopodites of third and fourth pereopods. First pleopods of first form male asymmetrically situated, reaching coxopodite of third pereopod, with a rounded hump on cephalic surface, and terminating in four distinct parts: mesial process subspiciform and directed caudodistad and somewhat laterad; cephalic process similar to mesial process, however, directed more

nearly distad; caudal element consists of a prominent rounded protuberance on distal caudolateral portion of appendage—caudal process and adventitious process lacking; central projection corneous, beaklike, and directed caudodistad. Annulus ventralis broader than long with a submedian depression and with an S-shaped sinus that is inclined dextrally. Sternum cephalad of annulus ventralis without prominences.

*Holotypic male, form I*.—Body subovate, compressed laterally, abdomen narrower than thorax (13.7 and 14.5 mm in widest parts respectively). Width of carapace less than depth in region of caudodorsal margin of cervical groove (14.5 and 15.5 mm).

Areola broad (about 2.6 times longer than broad) with 9 or 10 punctations across narrowest part; cephalic section of carapace about 25.7 percent of entire length of carapace.

Margins of rostrum not swollen, subparallel at base but strongly convergent from cephalolateral margin of carapace to about midlength of rostrum where they become subparallel and continue to tips of acute marginal spines. Acumen subspiciform and extends cephalad to distal end of peduncle of antennule; upper surface of rostrum with a concavity near base and subplane cephalically; entire dorsal surface with setiferous punctations; setae at base of acumen longer and prominent. The usual submarginal row of setiferous punctations present. Subrostral ridges weak but clearly defined, although not evident in dorsal aspect.

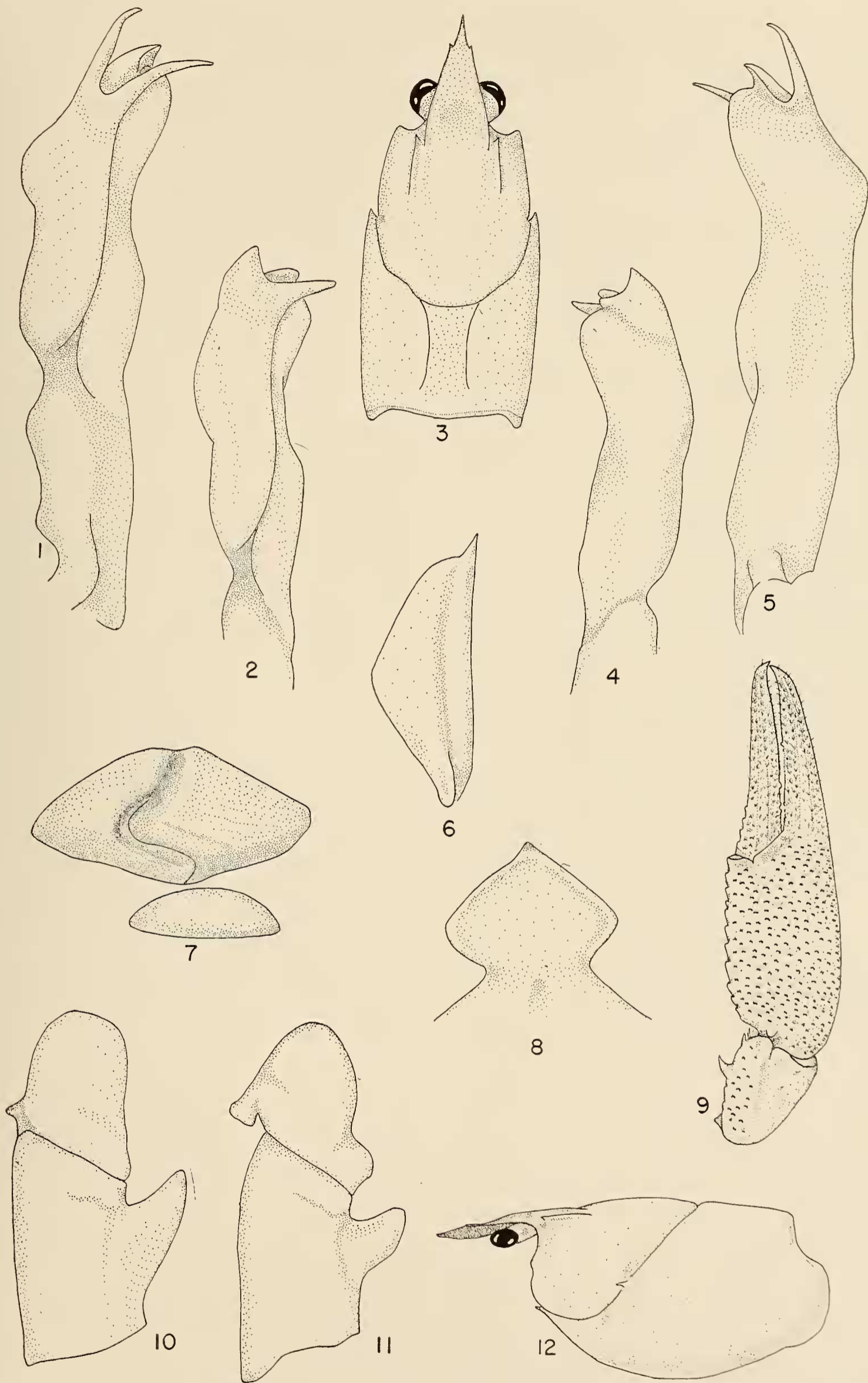
Postorbital ridges prominent, weakly grooved, and terminate cephalically in acute spines; suborbital angle small and forming almost a 90° angle; branchiostegal spine strong and acute. A prominent acute spine present on each side of carapace. Surface of carapace punctate dorsally and strongly granulate laterally.

Abdomen longer than carapace (36.5 and 31.9 mm).

Cephalic section of telson with four spines in each caudolateral corner.

Epistome (Fig. 8) broadly triangular and hirsute.

<sup>1</sup> *Hirsutus*, Latin = shaggy; so named because of the dense pubescence on the rostrum.



FIGS. 1-12.—*Procambarus hirsutus*, n. sp. (pubescence removed from all structures illustrated except in Fig. 9): 1, Mesial view of first pleopod of holotype; 2, mesial view of first pleopod of morphotype; 3, dorsal view of carapace of holotype; 4, lateral view of first pleopod of morphotype; 5, lateral view of first pleopod of holotype; 6, antennal scale of holotype; 7, annulus ventralis of allotype; 8, epistome of holotype; 9, distal podomeres of cheliped of holotype; 10, basipodite and ischiopodite of third pereopod of holotype; 11, basipodite and ischiopodite of fourth pereopod of holotype; 12, lateral view of carapace of holotype.

Antennules of the usual form with a strong acute spine on lower surface of basal segment.

Antennae extend caudad to third abdominal segment. Antennal scale (Fig. 6) of moderate width and with a strong spine at extremity of outer distal margin; lamellar portion with no distinct angles.

Right chela elongate, moderately slender, and except for fingers entirely tuberculate. Inner margin of palm with poorly defined rows of tubercles (in silhouette, 10 tubercles may be seen extending above the surface). Lower surface of palm with one tubercle somewhat larger than the others at base of dactyl. Fingers not gaping, both with poorly defined submedian ridges above and below. Upper opposable margin of immovable finger with a row of three small tubercles on proximal third and a larger one below this row near end of middle third. Lateral margin of immovable finger with a row of setiferous punctations, and upper and lower surfaces with similar punctations. Upper opposable margin of dactyl with a row of five small tubercles on proximal two-fifths and two larger tubercles below this row near distal portion of proximal third. Opposable margins of both fingers with crowded minute denticles along entire length. Mesial, upper, and lower proximal portion of dactyl with squamous tubercles; elsewhere with setiferous punctations.

Carpus of first right pereiopod about 1.5 times longer than broad with a broad shallow oblique furrow above; lateral half of podomere with scattered punctations, mesial half tuberculate. Mesial surface with two acute tubercles: one on upper distal margin and a larger one lying at a lower level near midlength. Lower surface with two spinous tubercles on distal margin: one opposite the articular socket on propus and the other mesial to it.

Merus of first right pereiopod with tubercles on upper surface, two of the more distal ones of which are acute and prominent. Lateral surface with scattered punctations; mesial surface with a few squamous tubercles distally. Lower surface with a mesial row of 13 prominent tubercles and a lateral one of 8. Small tubercles irregularly strewn between and to the sides of these two rows. Lower margin of ischiopodite with a row of four prominent tubercles.

Ischiopodites of third and fourth pereiopods bearing hooks (Figs. 10 and 11); hooks simple. Those on third subacute, and those on fourth

more truncate, recurved, and opposed by a prominent knob on basipodite.

Coxopodites of fourth and fifth pereiopods with the usual ventrally projecting prominences—those on fourth heavy and rounded; those on fifth compressed.

First pleopod (Figs. 1 and 5) reaching coxopodite of third pereiopod when abdomen is flexed. See diagnosis for description.

*Allotypic female*.—Differs from the holotype in the following respects: Rostrum extends cephalad beyond peduncle of antennule; antennae extend caudad to fourth abdominal segment; cephalic section of telson with only three spines in the caudodextral corner. There is an apparent secondary sexual difference in the chelae in that there is but a single row of minute denticles along the opposable margins of the fingers with a single row of five small tubercles along proximal third of dactyl and only two tubercles on immovable finger. (The holotype, morphotype, and a second form male of approximately the same size as the female have several rows of minute denticles instead of a single one.) Annulus ventralis (Fig. 7) subovate with the greatest length in the transverse axis. A slight elevation sets off an oblique suboval depression through which the S-shaped sinus courses. This elevation, more clearly visible in some specimens than in the allotype, is continuous with a longitudinal furrow cephalically. Sternum cephalic to annulus ventralis broadly excavate with no caudally projecting prominences. (See measurements.)

*Morphotypic male, form II*.—Differs from the holotype in only a few details. Rostrum with margins less convergent; antennae extend caudad

	Holotype	Allotype	Morphotype
Carapace:			
Height.....	15.5	12.9	13.9
Width.....	14.5	11.5	13.3
Length.....	31.9	26.4	29.3
Areola:			
Width.....	3.1	3.1	3.4
Length.....	8.3	7.0	8.2
Rostrum:			
Width.....	5.4	4.2	4.9
Length.....	10.4	8.7	10.0
Right chela:			
Length of inner margin of palm.....	10.5	4.3	6.7
Width of palm.....	7.7	3.3	4.7
Length of outer margin of hand.....	25.0 <sup>2</sup>	11.2	17.0
Length of dactyl.....	12.3 <sup>2</sup>	6.2	8.9

<sup>2</sup> Approximate, tips of fingers broken.

to telson; cephalic section of telson with only three spines in each caudolateral corner; fewer tubercles in each group enumerated above; hooks on third and fourth pereopods reduced. First pleopod (Figs. 2 and 4) with all terminal elements described for holotype although none is corneous, and each is reduced in size and is more obtuse.

*Measurements* (in millimeters).—As given in table at foot of opposite page.

*Color notes*.—Body dark brown with bright orange mottlings over entire carapace and terga of abdomen. A poorly defined dark saddle-like marking present in the form of a transverse bar across the caudal margin of the carapace and a pair of forward-projecting lateral horns on the lateral surfaces of the branchiostegites. This pattern is frequently modified so that the lateral horns are represented by two lateral pairs of dark spots representing the anterior and posterior portions of the horns. Upper surface of chelae brownish orange with black tubercles, while the tubercles on lower surface are light. Legs dark gray above and below; fingers of chelate appendages greenish blue as are distal podomeres of fourth and fifth pereopods.

*Type locality*.—Salkehatchie River, 1.9 miles south of Barnwell, Barnwell County, S. C., on State Highway 3. Here the river varies greatly in width, quite narrow in deep areas and more than 50 feet wide in the shallow reaches. The dark brown water flows over a sand and mud bottom and at the bridge are many rocks. *Vallesneria*, *Saururus cernuus*, and *Pontederia* are abundant. My specimens of *P. hirsutus* were collected at night on the open mud bottom and among the eelgrass. Associated with this species here were *P. troglodytes* (LeConte) and *P. echinatus* Hobbs.

*Disposition of types*.—The holotypic male, the allotypic female, and the morphotypic male are deposited in the U. S. National Museum, nos. 101148, 101150, and 101149, respectively. Of the paratypes, one male, form I, one male, form II, and one female are in the Tulane University Collection; two males, form I, two males, form II, and one female are in the collection of the Charleston Museum; 10 males, form I, nine males, form II, 26 females, 17 juvenile males, and 13 juvenile females are in my personal collection at the University of Virginia.

*Relationships*.—*Procambarus hirsutus* has its closest affinities with *P. pubescens* (Faxon) but may be readily distinguished from it by the in-

flated caudal knob, the absence of the caudal process, and the differences in form of the central projection of the first pleopod of the first form male. The orange mottlings on the carapace of *hirsutus* have also been observed in *P. pubescens*.

*Specimens examined*.—As follows:

**South Carolina: Aiken County**—Bridge Creek, 10.6 miles north of Aiken on U. S. Highway 1 (4♂♂I, 3♂♂II, 4♀♀, 8 juv.♂♂, 8 juv.♀♀), April 19, 1955, E. A. Crawford, T. R. Bello, and H. H. H., coll.; *ibid.* (1♀, 2 juv.♂♂, 1 juv.♀), September 13, 1955, H. H. H., coll.; Cedar Creek, 10.6 miles southwest of Wagener on State Highway 215 (1♂II, 8♀♀, 5 juv.♀♀, 3♀♀ with eggs), April 19, 1955, E.A.C., T.R.B., and H.H.H., coll. **Allendale County**—Tributary of Salkehatchie River, 3.4 miles south of Ulmers (2♂♂I) June 7, 1949, R.D. Suttkus, coll.; 7.2 miles east of Allendale on State Highway 641, Miller Swamp Creek (1♂II, 2 juv.♀♀, 1 juv.♀), August 15, 1947, H.H.H., coll.; stream 8.5 miles north of Allendale on State Highway 28 (1♂I, 1♂II, 1 juv.♂, 1 juv.♀), August 15, 1947, H.H.H., coll.; between Appleton and Martin (2♂♂II, 1♀), G. R. Lutz, Jr., coll. **Bamberg County**—Georges Creek, 9 miles south east of Barnwell on State Highway 64 (2♂♂II, 3 juv.♂♂, 2 juv.♀♀), September 3, 1949, W. R. West and H.H.H., coll.; creek, 3.8 miles southeast of Olar on State Highway 64 (1 juv.♂), September 3, 1949, W.R.W. and H.H.H., coll.; Little Salkehatchie River, 4.3 miles east northeast of Ehrhardt on State Secondary Highway 21 (1♂I, 3♂♂II, 7♀♀, 1 juv.♂, 1 juv.♀), June 25, 1956, Anderson, Dunbar, and Smoak, coll.; South Fork of Edisto River, 4.75 miles north of Denmark on U. S. Highway 321 (1♀), August 17, 1955, H. W. Freeman, coll.; Lemon Creek, 8.8 miles south southeast of Bamberg on State Secondary Highway 84 (3♂♂I), June 26, 1956, A., D., and S., coll. **Barnwell County**—Type locality (2♂♂I, 1♂II, 2♀♀), September 3, 1949, W.R.W. and H.H.H., coll.; *ibid.* (7♂♂I, 6♂♂II, 21♀♀, 7 juv.♂♂, 5 juv.♀♀, 1♀ with eggs), April 19, 1955, E.A.C., T.R.B., and H.H.H., coll.; 3.5 miles east of Barnwell on State Highway 70, Bryan's Chapel Creek (3♀♀, 3 juv.♂♂, 3 juv.♀♀), August 16, 1947, H.H.H., coll.; near Robbins (1♀), August 24, 1933, G.R.L., coll.; Hattie Creek, 2 miles northeast of Hattieville (1♀), March 30, 1953, H.W.F., coll.; Creek at west city limits of Barnwell (1♂II, 2♀♀), April 19, 1955, E.C.A., T.R.B., and H.H.H., coll. **Calhoun County**—Spring Creek on U. S. Highway 176 (1♂I), August 11, 1955, H.W.F., coll. **Colleton County**—15 miles northwest of Walterboro on State Highway 64 (2♂♂I), July 11, 1934, E. B. Chamberlain, coll. **Lexington County**—north fork of

Edisto River, 6.2 miles northeast of Wagener on State Highway 215 (1♂II, 2♀♀, 1 juv.♂, 4 juv.♀♀), September 4, 1949, W.R.W., H.H.H., coll.; *ibid.* (2♂♂I, 1♀, 1 juv.♀), April 19, 1955, E.A.C., T.R.B., and H.H.H., coll.; headwaters of Red Bank Creek, 3.2 miles southwest of Red Bank (3♂♂II) July 23, 1953, H.W.F., coll.; Black Creek, 4.5 miles west southwest of Pelion on U. S. Highway 178 (1♂I, 2♀♀), July 5, 1956, H.W.F., coll. *Orangeburg County*—north fork of Edisto River on U. S. Highway 321 (5♂♂II, 5♀♀, 14 juv.♂♂, 12 juv.♀♀), August 15, 1955, H.W.F., coll.; Goodby's Creek on U. S. Highway 176, 2 miles south of junction with U. S. Highway 301 (1♂I, 6♂♂II, 3♀♀, 2 juv.♂♂, 2 juv.♀♀), January 31, 1955, H.W.F., coll.

The range of this species appears to be confined to the drainage systems of the Edisto, Salkehatchie, and Savannah Rivers in South Carolina.

*Remarks.*—*Procambarus hirsutus* appears to be abundant in the Salkehatchie drainage system and is the only member of the Pictus Subgroup represented in it. In the Edisto its range is apparently overlapped by that of an undescribed species of the subgroup, and it shares the Savannah drainage system with *P. pubescens*. Much collecting is needed in the coastal plain tributaries of the Savannah River to determine how widespread these two species are, and to what extent, if any, their ranges overlap.

While there are a number of minor variations in the specimens at hand, chiefly in the shape of the rostrum, none of them is associated with a restricted portion of the range.

As may be noted above, first form males have been collected in January, April, June, July, August, and September. Females with eggs have been found in April.

***Procambarus ancylus*,<sup>3</sup> n. sp.**

*Cambarus penicillatus* Hagen (not LeConte), 1870: 54 (in part), figs. 95, 96; Faxon, 1884: 138 (in part); 1885: 36-38 (in part).

Hagen (1870: 54) identified two second form males and two females (M.C.Z. no. 250) as *C. penicillatus*. Faxon (1884: 138) stated that while these specimens may be members of that species "they differ in so many respects, that I suspect they belong to another species." In 1885 (p. 37) Faxon pointed out wherein these specimens

<sup>3</sup> *Ancylus*, Greek = curved; so named because of the strongly and similarly curved terminal elements of the pleopod of the male.

differed from the male of *C. penicillatus* (= *P. barbatus*) that he had from Georgia. Faxon (1890: 621) reiterated the same opinion expressed in 1884 concerning these four specimens.

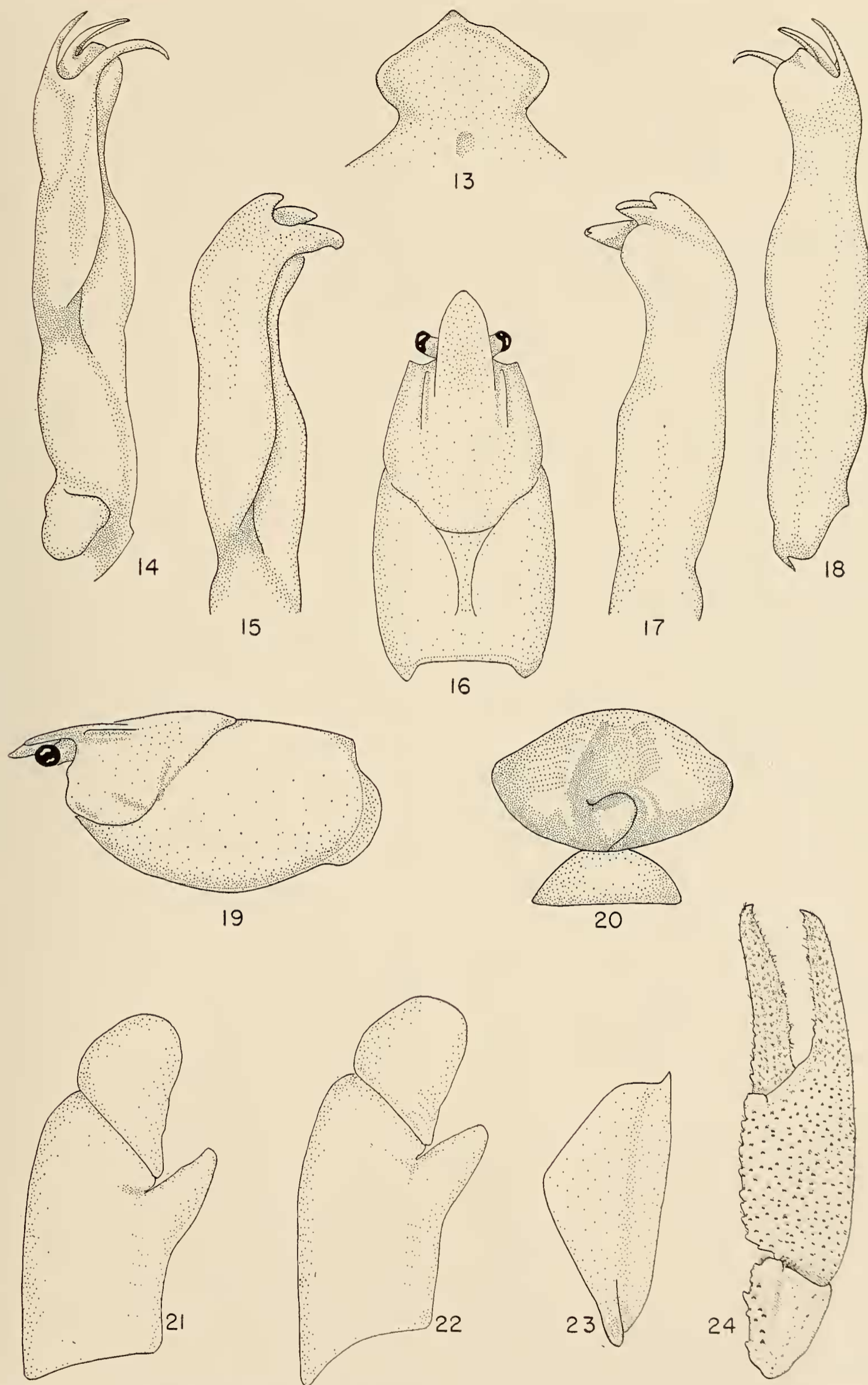
I have examined these four crayfishes and concur with Faxon's opinion that they belong to "another species," and with the additional specimens cited below am convinced that they represent one which has not previously been named.

*Diagnosis.*—Rostrum with marginal spines or with uninterrupted margins; acumen variable—short and triangular or subspiculiform; areola 4.8 to 9.0 times longer than broad with two to four punctations in narrowest part; length of areola 32.0 to 35.0 percent of entire length of carapace; inner margin of palm of chela bearing irregularly strewn squamous tubercles; post-orbital ridges terminating bluntly or in acute spines; one spine (occasionally two), subacute or tuberculiform, present or absent on each side of carapace. First pleopods of first form male asymmetrically situated, reaching coxopodites of third pereopods, with a slight hump, sometimes turned mesiad on cephalic surface, and each terminating in four parts: mesial process noncorneous, subspiculiform, and directed caudolaterad with its tip lying lateral to the lateral surface of the main shaft of the appendage; cephalic process noncorneous, long, slender, and directed caudodistad; caudal element represented by the inflated caudal knob; central projection corneous, slender, and directed caudodistad. Annulus ventralis with a marked median longitudinal depression (in ventral aspect) in the caudal half of which courses a reversed C-shaped sinus. Sternum immediately cephalic to annulus ventralis with or without a pair of caudally projecting prominences.

*Holotypic male, form I.*—Body subcylindrical. Abdomen narrower than thorax (11.1 and 13.0 mm in widest parts, respectively). Width and height of carapace subequal in region of caudodorsal margin of cervical groove (13.0 and 12.7 mm).

Areola moderately narrow (8.9 times longer than broad) with one or two punctations across narrowest part; cephalic section of carapace 1.9 times as long as areola (length of areola about 34 percent of entire length of carapace).

Rostrum with margins gently converging to base of acumen where there is only the slightest interruption setting the short acumen off from



FIGS. 13-24.—*Procambarus ancylus*, n. sp. (pubescence removed from all structures illustrated except in Fig. 24): 13, Epistome of holotype; 14, mesial view of first pleopod of holotype; 15, mesial view of first pleopod of morphotype; 16, dorsal view of carapace of holotype; 17, lateral view of first pleopod of morphotype; 18, lateral view of first pleopod of holotype; 19, lateral view of carapace of holotype; 20, annulus ventralis of allotype; 21, basipodite and ischiopodite of third pereopod of holotype; 22, basipodite and ischiopodite of fourth pereopod of holotype; 23, antennal scale of holotype; 24, distal podomeres of cheliped of holotype.

remainder of rostrum; acumen reaching base of ultimate segment of peduncle of antennule; margins of rostrum only slightly elevated, not swollen; upper surface slightly concave; a single submarginal row of setiferous punctations extends from base of rostrum to tip of acumen on each side.

Postorbital ridges moderately well developed, only slightly grooved, and terminating cephalically bluntly; suborbital angle almost obsolete; branchiostegal spines small, and not sharply pointed; subrostral ridges moderately well developed but not evident in dorsal aspect. Lateral surface of carapace with only one tubercle on left side slightly larger than others, none on right. Surface of carapace punctate dorsad and weakly granulate laterad.

Abdomen longer than carapace (31.0 and 26.0 mm).

Cephalic section of telson with three spines in the left and four in the right caudolateral corners.

Epistome (Fig. 13) broadly subtriangular and slightly emarginate, and with a small cephalo-median projection.

Antennules of the usual form with a moderate spine on basal segment of peduncle.

Antennae broken but in another specimen from the type locality extends caudad to the third abdominal segment. Antennal scale (Fig. 23) moderately broad and with a small spine at extremity of outer distal margin. Lamellar portion with no distinct angles.

Right chela elongate, palm only slightly inflated and entirely tuberculate. Inner surface of palm with several irregular rows of tubercles, and when viewed in silhouette with 10 or 11 visible. Lower surface of palm with one moderately conspicuous tubercle at base of dactyl. Fingers not gaping. Upper and lower surfaces of both fingers with low submedian ridges flanked on each side by setiferous punctations. Opposable surface of immovable finger with a row of three rounded tubercles on basal half of finger and a single large tubercle below this row at base of distal third. Crowded minute denticles occur along entire opposable surfaces of both fingers. Lateral surface of immovable finger with a row of setiferous punctations. Upper opposable surface of dactyl with a row of five tubercles on basal half. Mesial margin of dactyl with a row of six tubercles on basal half distad of which is a row of setiferous punctations.

Carpus of first right pereiopod about 1.4 times

longer than broad with a shallow oblique furrow above. Mesial half of podomere tuberculate and lateral half with scattered punctations. Only four tubercles on podomere conspicuous and these correspond in their positions to the spines described for *P. hirsutus*.

Merus of first right pereiopod with tubercles along upper surface, two of the more distal ones of which larger than others. Lower surface with a lateral row of 11 tubercles and a mesial one of 14; small tubercles scattered between and to the sides of these two rows. Ischiopodite with a row of six tubercles on lower margin.

Ischiopodites of third and fourth pereiopods (Figs. 21 and 22) with hooks; hooks simple, that on fourth slightly heavier than that on third; basipodite of fourth not swollen to oppose corresponding hook on ischiopodite as in *P. hirsutus*. Coxopodites of fourth and fifth pereiopods as in *hirsutus*.

First pleopods (Figs. 14 and 18) asymmetrically situated (the left more caudal in position) and reaching coxopodites of third pereiopods when abdomen is flexed. For description see diagnosis.

*Allotypic female*.—Differs from the holotype in only a few minor details: Epistome narrower but subtriangular; areola 4.8 times longer than wide with three punctations in narrowest part; cephalic section of telson with four spines in each caudolateral corner; chela broader and shorter than in holotype and dactyl with but a single row of five tubercles on basal half; both fingers with a single row of minute denticles. Annulus ventralis (Fig. 20) subovate with the greatest length in the transverse axis; a broad, median, evenly contoured excavation traverses its length; a reversed C-shaped sinus is situated in the caudal half of the declivity. (See measurements.)

*Morphotypic male, form II*.—Differs from the holotype only slightly: Epistome narrower as in allotype; areola 5.8 times as long as wide; cephalic section of telson with three spines in each caudolateral corner; opposable margin of immovable finger of right chela with two tubercles instead of three in basal half; corresponding surface of dactyl with a single curved row of five tubercles. Secondary sexual characteristics with usual reductions. First pleopod (Figs. 15 and 17) with all elements of the holotype clearly represented but cephalic process and central projection shorter and heavier, and the mesial process, while more massive, noncorneous. (See measurements.)

*Measurements* (in millimeters).—As follows:

	Holotype	Allotype	Morphotype
<b>Carapace:</b>			
Height.....	12.7	11.0	12.0
Width.....	13.0	11.0	12.0
Length.....	26.0	22.3	24.7
<b>Areola:</b>			
Width.....	1.0	1.6	1.5
Length.....	8.9	7.6	8.7
<b>Rostrum:</b>			
Width.....	4.1	3.6	3.8
Length.....	6.2	5.3	6.4
<b>Wight chela:</b>			
Length of inner margin of palm.....	8.5	4.6	7.5
Width of palm.....	7.0	4.3	6.0
Length of outer margin of hand.....	22.2	12.1	19.0
Length of dactyl.....	11.4	6.1	9.3

*Color notes.*—While the colors of the specimens from the type locality are not known the following applies to a first form male collected in Colleton County, S. C. Carapace dark brown dorsally with a median light brown stripe (about the width of the areola) running its full length. In the cephalic region the light stripe is subtended by a pair of dark stripes that extend caudally to the level of attachment of the mandibular muscles where there is a pair of distinct black spots. Lateral portions of branchiostegites with a pair of black stripes (corresponding to the horns of the saddle described for *hirsutus*) below which the color is lighter brown with cream splotches concentrated immediately below the black stripes. Abdomen straw brown above and with the lower portion of each pleuron bearing a light spot. Each epimeron also with a light spot. Uropods and telson concolorous with the abdomen but with dark brown spots. Chelae dark brown above and with an olive-green cast below.

*Type locality.*—Summerville, Dorchester County, S. C. No description of the habitat from which the crayfish were taken is available.

*Disposition of types.*—The holotype, allotype, and morphotype are in the collection of the Charleston Museum (no. 33: 132). Two paratypic males, form I, one female, and three juvenile females are also in the same collection. One male, form II, and one female are in the collection of the U. S. National Museum. One male, form I, three males, form II, 13 juvenile males, and 47 juvenile females are in my personal collection at the University of Virginia.

*Relationships.*—*Procambarus ancylus*, a mem-

ber of the Seminolae Subgroup, has its closest affinities with *P. lunzi* from which it may be distinguished readily by the more spiculiform terminal elements of the first pleopod of the male, and by the excavated annulus ventralis of the female. More distantly it is related to *P. seminolae*. All three members of the Seminolae Subgroup frequent lentic habitats (*ancylus* and *seminolae* are also found in lotic situations), and in this respect differ from the typically lotic members of the Pictus Subgroup.

*Specimens examined.*—As follows:

**North Carolina:** *Bladen County*—White Lake (2♂♂II, 2 juv. ♀), July 25, 1947, D. G. Frey, coll.; *ibid.* (2 juv.♂♂, 4 juv.♀♀) September 9, 1947, D.G.F., coll.; Singletary Lake (1♀) March 2, 1947, D.G.F., coll.; *ibid.* (1♂I, 1♀), April 11, 1955, J. R. Bailey, coll. *Brunswick County*—Wet Ash Swamp, 8 miles northwest of Shallotte on Route 130 (1♂II, 1♀), March 29, 1949, E. C. Raney, coll. *Columbus County*—White Marsh, 1.9 miles east of Whiteville on U. S. Highway 76 (1♂I, 2♂♂II, 2♀♀, 6 juv.♂♂, 7 juv.♀♀), September 1, 1949, W.R.W., H.H.H., coll. **South Carolina:** *Berkeley County*—roadside ditch, 30.8 miles northwest of Charleston on Route 31 (2♀♀) April 20, 1955, T.R.B., H.H.H., coll.; Richmond Plantation, 40 miles up Cooper River from Charleston (2♀♀, 3 juv.♀♀), March 22, 1939, T. K. Ellis, coll. *Charleston County*—U.S.N.M. no. 44438, no locality (1♂II), April 22, 1911, Mearns, Riley, and Brown, coll.; M.C.Z. no. 250, "Charleston" (2♂♂II, 2♀♀); 21.1 miles west of Charleston on U. S. Highway 17 (11 juv.♂♂, 36 juv.♀♀), September 3, 1949, W.R.W., H.H.H., coll. *Colleton County*—pond, 7.1 miles northwest of Walterboro on State Highway 64 (1♂I, 2♂♂II, 3 juv.♀♀), September 3, 1949, W.R.W., H.H.H., coll.; pond, 8.3 miles northwest of Walterboro, State Highway 64 (1 juv.♂, 3 juv.♀♀), August 15, 1947, H.H.H., coll.; roadside ditch, 7.6 miles northwest of Walterboro on State Highway 64 (1 juv.♂, 5 juv.♀♀), August 15, 1947, H.H.H., coll. *Dorchester County*—Summerville (type locality), (3♂♂I, 1♂II, 1♀), May 28, 1932, G.R.L., coll.; drainage ditch in Summerville (1♂II), August 16, 1947, H.H.H., coll. *Kershaw County*—Town Creek, 3 miles southeast of Camden on U. S. Highway 521 (2♂♂I, 3♂♂II, 4♀♀, 1 juv.♂, 1 juv.♀), April 6, 1955, H.W.F., coll. *Lee County*—2.5 miles north of Bishopville on U.S. Highway 15 (1♂I, 1♀, 5 juv.♀♀), December 22, 1956, H.H.H., coll. *Lexington County*—north fork of Edisto River, 6.2 miles northeast of Wagener on State Highway 215 (1 juv.♂, 2 juv.♀♀), September 4, 1949, W.R.W., H.H.H., coll.; Black Creek,



4.5 miles west southwest of Pelion on U. S. Highway 178 (2♂♂I, 2♀♀), July 5, 1956, H.W.F., coll. *Richland County*—approximately 100 specimens from the eastern part of the county.

*Remarks.*—The variations within the specimens of this species are about as numerous as are to be found in any other species of the genus. The majority of these differences appear to be correlated with the habitat from which the specimens were taken, and there are no variations that have been demonstrated to be clinal or restricted to a certain portion of the range. Specimens collected from burrows or from temporary bodies of water have, in general, a blunt acumen, lack spines on the rostrum, the postorbital ridges, and the sides of the carapace; and most of the spines on other regions of the body are either absent or are reduced to tubercles. In contrast, those specimens collected from permanent bodies of water, whether streams or lentic habitats have acute spines in all the positions mentioned above, and frequently have a spinelike acumen. Of interest is the fact that all small juvenile animals, regardless of the habitat from which they were collected, are similar to adults living in permanent bodies of water. The first pleopod of the male is remarkably uniform throughout the range, and except for the width of the longitudinal excavation of the annulus ventralis it exhibits little variation. The sternum immediately cephalic to the annulus ventralis frequently bears paired caudally projecting prominences.

First form males have been collected in March, April, May, and September, and females with eggs in March and April.

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*Hypotheses, and deductions from these, controlled by sense-observations and analogies with what we know elsewhere, are to be thanked for all of science's results.*—WILLIAM JAMES.